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REPORT
OF THE JOINT ECA/UAR SEMINAR ON RAILWAY MANAGEMENT AND OPERATION
ADDIS ABABA, ETHIOPIA
22 TO 26 NOVEMBER 1982

A. INTRODUCTION

1. The seminar, organized by ECA and the Union of African Railways with the assistance of the French Government took place in Africa Hall, Addis Ababa, Ethiopia from 22 to 26 November 1982.

B. ATTENDANCE AND PARTICIPATION

2. Representatives of the following railway networks attended the seminar: Algeria, Benin-Niger, Djibouti-Ethiopia, Egypt, Gabon, Libyan Arab Jamahiriya, Madagascar, Mali, Nigeria, Senegal, Tanzania-Zambia, United Republic of Tanzania and Zimbabwe.

3. Representatives of the French Government in the seminar were the following: Ecole nationale des ponts et chaussées, Société nationale des chemins de fer français and Office Français de coopération pour les chemins de fer et les matériels d'équipement /OFERMAT/.

C. OPENING OF THE SEMINAR

4. The opening session was chaired by the Permanent Secretary of the Ministry of Transport and Communications of Socialist Ethiopia. He addressed the participants on behalf of the Government and said that the Provisional Military Government of Socialist Ethiopia has made and continues to make genuine contribution to the development of railway transport and gives serious attention to the Lagos Plan of Action. He emphasized the significance of railways in Africa and the attention given to this mode by respective African Governments which appears from the high percentage of funds allocated to railways in the Transport and Communication Decade programme. He said that railways contribute towards national economies and if they are properly maintained, they will form the basis for railway network development in Africa. He emphasized the role the Union of African Railways has to play in this respect. He noted that this is the second seminar to be held in response to the ongoing efforts to assist African railway transport executives to exchange experience and information. He called for strong and enthusiastic participation during the course of the Seminar.

5. Thanking ECA/UAR and the French Government, the Permanent Secretary wished participants successful deliberation and happy stay in Addis Ababa.

6. Mr. Marc Manirakiza, ECA Deputy Executive Secretary welcomed the participants to the Seminar and briefly reviewed the background of United Nations Transport and Communications Decade programme in Africa. He gave an account of the progress of implementation of the programme on the first phase and preliminary observations on the second phase of the Decade programme. He explained that phase I of the railway programme consisted initially of 79 projects estimated at $5.4 million, and was now reduced to 69 projects estimated at a cost of $3.12 billion out of which $2.45 billion has been secured.

7. As far as phase II is concerned it comprised 54 projects for a total amount of $8.1 billion out of which $ 3.5 billion 16secured or in the pipeline.

This percentage of 43.13 shows the great importance and confidence attached to the railway subsector in Africa. With this background the Deputy Executive Secretary returning to the subject matter of the seminar, said that skillful and trained manpower is very essential to get an efficient railway. He said that training of both management and technical personnel at all levels should be regular and continuous in all African networks. In the light of this fact the project RAP-01 will be carried over to phase II of the Decade.

8. The Deputy Executive Secretary highlighted the close association between UAR and ECA in the railway programme and praised the dynamic efforts of the UAR Secretary-General in this field.

9. Finally he thanked the French Government for their contribution, the Government of Socialist Ethiopia for the valuable assistance provided in the organization of this seminar and concluded by wishing participants fruitful discussion and a happy stay in Ethiopia.

10. Mr. Hizekiel Isaac, Chief of Transport of the Organization of African Unity addressed the participants on behalf of the Secretary-General of OAU saying that this seminar is one of a series of seminars organized by UAR in the context of project RAP-01. He mentioned that this seminar tackles a very important issue, that is improvement of managerial skill which will result in good operation and ultimately higher productivity.

11. He continued by saying that managers, administrators and technicians are not only in short supply but are inadequately equipped in their respective trades and that this seminar will afford the opportunity of exchanging views and identifying difficulties and propose solutions to the problems of management and operation in Africa.

12. He concluded by wishing participants every success.

13. After expressing his gratitude to the Government of Socialist Ethiopia and the Ethiopian Railways for their contribution, the UAR Secretary-General explained how UAR and ECA have been co-operating to establish the transport infrastructures necessary for the economic development of Africa. He thanked the French Government for their continued assistance and also thanked the "Ecole nationale des ponts et chaussées, the "SNCF" and OFERMAT.

14. He then reviewed very quickly the railways and rail transport subsector programme of the Transport and Communications Decade in Africa and emphasized the great financial responsibility African countries have taken upon themselves in order to implement this programme.

15. The full benefits of these financial contributions can only be realized when competent men are in charge of their management. The Secretary-General intimated that UAR has drawn up a programme for the establishment of four subregional training centres at Brazzaville (the Congo), Kabwe (Zambia), Zaria (Nigeria) and Wardan (Egypt). UAR also prepared a programme of meetings and seminars. He also recalled that UAR collaborates with several countries and institutions in organizing refresher courses for African managerial staff.

16. The Secretary-General emphasized the importance of this seminar on railway management and operation and said that with an effort commensurate with their responsibilities, managers of African railways could give rail transport a key position among other means of transport.

17. He continued about the results of the attempts made by UAR to standardize African railways (particularly the equipment) and once again expressed his confidence in the future of rail transport. He concluded by wishing the seminar every success.

18. Having mentioned the undisputed importance played by continuing education within the firm and in the nation, the representative of the "Ecole Nationale des Ponts et des Chaussées"(ENPC) spoke about his institution. He said that the ENPC is the oldest of the French technical schools and that 30 per cent of its trainees are foreigners. He expressed his appreciation for being able to participate in this Seminar which will afford railway officials the opportunity to acquire new knowledge and exchange experiences.

19. He then thanked all those who had collaborated in the organization of the seminar, among them UAR, ECA, the Ethio-Djibouti Railway, the SNCF and OFERMAT. He wished the railway management seminar good success.

20. The Permanent Secretary of the Ministry of Transport and Communications of Socialist Ethiopia then declared the Seminar on Railway Management and Operation open.

C. ADOPTION OF THE AGENDA AND ORGANIZATION OF WORK

21. The representatives of the railways elected the General Manager of Djibouti-Ethiopia Railway as Chairman of the Seminar.

22. The Chairman then thanked the participants for their confidence and resumed the work of the Seminar.

23. The following agenda was adopted:

1. Opening of the meeting:
   (a) Statement of the Permanent Secretary of the Ministry of Transport and Communications of Socialist Ethiopia
   (b) Statement by the Deputy Executive Secretary of ECA
   (c) Statement of the Representative of the Secretary-General of OAU
   (d) Statement of the Secretary-General of the Union of African Railways
   (e) Statement of the Deputy Director of the Ecole nationale des ponts et chaussées
2. Adoption of the agenda and organization of work
3. General organization of a railway network by Mr. Alias
4. Finance and accounting by Mr. Soret

5. Commercial and technical operation by Mr. Alibert
6. Signalling by Mr. Savarzeix
7. Personnel management by Mr. Soret
8. Telecommunications by Mr. Savarzeix
9. Evaluation of the Seminar
10. Adoption of the report
11. Closure of the Seminar

D. ACCOUNT OF PROCEEDINGS

General organization of a railway network (agenda item 3)

24. Having expressed his thanks to the organizers and having recalled the success of the seminar at Pointe Noire, M. Alias proceeded to give some general information about the seminar and the lecturers. He then turned his attention to the theme: railway management. Like all commercial enterprises, railways should apply the principles of modern management to their specific problems.

25. After the strategic objectives of the enterprise have been set by the highest authorities, it falls to authorities in each service to draw up a vigorous plan which is then to be monitored in order to reduce the gaps which always exist between anticipation and actual implementation.

26. In dealing with this topic of planning, the lecturer called attention to a number of characteristics of the rail transport: the importance of staff problems, the need for research and investment, the choice of investment.

27. But it is important to have detailed knowledge of cost in order to control it properly. As such, it is essential to have rational budget management so that the railway network can balance incomes and expenditure no matter the type of economy it is operating under. There should also be a clear and sound transport policy and problems related to public service financing and usage rights of the transport infrastructures should be resolved satisfactorily.

28. M. Alias concluded his lecture by analyzing the different ways of organizing the railway network and giving detailed information about the structures which are not an end in themselves but are among the factors necessary for implementing the strategic plan.

29. During the exchange of views which followed, the lecturer replied to several questions and explained in detail a few points from his lecture. Concerning staff, he particularly emphasized the need for executives to deploy inefficient employees in the best possible way.

30. He also re-emphasized the need for a global transport policy in order to avoid some of the wastage which several speakers mentioned.

31. In conclusion he expounded the following points:

- The need to appeal to Governments for the necessary fare increases or at least a fair compensation for the services of the railways in case of refusal to grant the increases;

- The need to take into account fixed charges when working out costs;

- The importance of not making frequent drastic change to structures;

- The possibility of including the cost of running empty trains in marginal costs;

- The possibility of some networks maintaining steam engines.

32. The principal speakers were the representatives of Gabon, Senegal, Benin-Niger, Zimbabwe, Mali and Algeria.

Finance and amounting (agenda item 4)

33. The aim of accounting and financial management is to monitor the profitability of the network's activities and ensure its financial equilibrium.

34. In his first lecture, Mr. Sorect talked about accounting.

35. The first role of profitability monitoring is to study financial operations. The accounting system makes it possible to measure and analyze profitability components. Financial accounting enables the management to prepare the financial statement for the network and to calculate its operating result and net result for a given period. Financial accounting procedures also provide values of certain indicators which are useful for management purposes: turnover, production, value added, gross operating surplus, cash flow.

36. Cost accounting makes it possible to calculate cost prices. Each network should build its own system of cost accounting to meet the requirements of its organization, structure and management control. Cost accounting is indispensable for accurate computation of transport tariffs and for providing the necessary management control data for the various department estimates.

37. Profitability monitoring also deals with investments. Investing means spending immediately and safely a given amount of money with the prospect of making profit in the future. Computation of profitability helps to reduce the element of uncertainty involved in any investment. The most ideally used methods of calculating it are based on the principle of discounting recovery period for the capital invested, discounted balance sheet, internal rate of return. Such calculations (investment expenditure and expected returns and choice discounting rates) can be made much easier by establishing variants which make it possible to determine the range of results in relation to the hypothesis adopted.

Discussion

(i) Computing amortization quotas

38. One participant asked what should be done when amortization quotas calculated on linear basis become insufficient for the purchase of new equipment because investments had not been made over a long period due to inflation.

39. The speaker replied that apart from the re-evaluation of assets which usually has to be authorized by the State, the network should make provisions for bearing the cost of renewal. In the case of equipment, this should be calculated on the basis of the cost of the new item and for permanent structures; such calculations should be based on the estimates given for the repairs to be carried out. These provisions should be included as part of the operating expenses and spread over a period of several years.

40. Another participant raised the question of payment of annual installments for renewal of equipment.

41. The speaker replied that this system had been abandoned by the SNCF since 1970. It did not in fact respect accounting procedure, but it did have the advantage of enabling the SNCF to secure funds needed for renewal since the State used to pay a complementary subsidy.

(ii) Profitability of railway investments

42. Many participants stressed the need to take into account the socio-economic repercussions of railway investments when calculating the profitability of such investments.

43. In the same vein, the Secretary-General of UAR emphasized the need for "social" accounting. This is the subject of a series of studies in which UAR is participating.

44. Moreover, for large-scale investments, balance sheets should be drawn up for the community taking into account the effects of these investments on the nation as a whole.

45. Finally, it was pointed out that the discounting tables do not take into consideration the data on depreciation and financing. What the profitability rate actually signifies is that if the network secures financing at a cost equal to this rate, the profit realized by the investment will enable the network to pay back this loan and pay interest on it without profit or loss.

46. In his second lecture, the speaker talked about financial management.

47. All enterprises must pay their debts on time, all the time. In order to do this, they have at their disposal all the financial resources required to cover their needs, whether they arise from investments or trading operations. The golden rules maintaining financial equilibrium (balance between type of sources and

type of utilization of funds, the existence of working capital and a cautious attitude towards incurring debt) are still valid since the network cannot guarantee that it will be able to renew its current loans. When such renewal is possible, the ceiling of indebtedness is determined by the burden of the cost of financing, which has to be paid for by the operating result and not by fresh loans.

48. Cash management is aimed at reducing the amount of working capital needed by taking the necessary action in respect of relations with network partners (customers, suppliers, staff, State) and within the organization itself (particularly concerning the movement of funds). Cash management should also ensure that cash outflow and income balance from day to day. Attentive monitoring of cash makes it possible to save substantial amounts of financial costs, very quickly and without spending anything.

49. The international aspect of financial administration is becoming more and more important for networks because of purchases made abroad, external financing in foreign currency, and the interconnection of networks. The main problem from the financial point of view is that of the risks involved due to changing exchange rates, when a network has debts and assets expressed in a currency other than the national one; the fact that the international money market has experienced serious upheavals for the past 10 years or so, has lead to considerable fluctuations in exchange rates. Since there is always some room for manoeuvre, the network should try to negotiate with its suppliers in an attempt to reduce the exchange risk and manage its external debt in such a way that there is a mixture of loans in hard currencies and soft currencies, fixed interest and variable interest rates; it should also strike a balance between spreading repayments more evenly and using advanced repayment clauses.

Discussion

50. At the request of several participants, the speaker gave some technical details on provisions made for payment of cheques issued by the network, on the monitoring of customers' accounts, on ways of ensuring that deadlines forpay payment stipulated by contract are respected and on the "treasury" aspect of relations with the State.

International financing

51. Although he did not question the success achieved by the European networks in financial co-operation through Eurofirma, the Secretary-General of UAR pointed out that African networks were adopting a more modest approach. He felt that it was most important for them to organize themselves so that they could place joint orders overseas and thus conclude more satisfactory deals with their suppliers.

52. The representative of the Benin-Niger network requested UAR to make arrangements for the most heavily indebted networks to be granted at least partial remission of their debts. The Secretary-General of UAR said that a motion could be drafted on this subject.

53. Finally, the representative of the Mali network stressed the fact that it is becoming more and more current practice to finance investments through supplier credit over very short periods and he hoped that arrangements would be made with financing institutions to obtain longer repayment periods.

Commercial and technical operations (agenda item 5)

(a) Commercial operations

54. After an introduction on the economic notions related to railway transport, the speaker insisted on the urgent need for each network to operate its traffic and at the same time minimize its total expenditure and sell its services at a price which is higher than their marginal cost because this would enable them to levy charges which would cover their fixed costs. A detailed explanation was given of the analysis of a network's cost prices and the calculation of marginal costs.

55. In view of the special characteristics of railway infrastructure which represent very large-scale investments, their user tariffication poses a delicate problem as far as relations between networks and States are concerned: several procedures were discussed, all founded on the marginal cost, but the most widely adopted are tariffing system based on budgetary equilibrium and the system based on the total cost including capital costs.

56. The elaboration of a passenger marketing policy must always be preceeded by a marketing study: need and motive for travelling, services provided by competitors. It can be built around several factors: suitability of services to customers' demands, level of comfort of coaches, ancilliary services such as catering and reservations. The need to train all railway staff in order to instill a commercial attitude in them was stressed. General passenger tariffication must be supplemented by special fares (season tickets, party travel, combined tickets, reduced rates which are subsidized by the State). The complementarity of various modes of urban transport in large towns presents considerable advantages for the different communities.

57. As far as freight is concerned, marketing is more complex for there is not one but several transport markets with different characteristics depending on the type of goods or the type of customer (buyer or seller). Marketing policy should make sure that transhipment is avoided and that door-to-door transportation is given priority, by establishing private sidings or using combined rail/road techniques or containers. The adaptation of rolling stock to customer requirements, improved forwarding facilities, increased contacts between marketing staff and present or potential railway customers are other important areas of marketing activities. Interconnected railways should adopt common rules and regulations for after-sales services which should not be neglected.

58. Freight tariffing, based on marginal costs takes into account the weighted distance covered, wagon load, type of freight as defined in a common nomenclature published by UIC and uses maximum and minimum scales. Several methods of international traffic tariffing which make it possible to fight competition were described. A film on the wagon-carried Kangaroo trailers was then shown.

59. In answer to very relevant questions from the representatives of Senegal, Mali, Benin-Niger and Algeria, the UAR Secretary-General emphasized the need for railways to be more aggressive in their commercial activities, train their staff in such a way as to rid them of their civil service mentality so they would become real salesmen, to try to attract potential customers through advertising (even

if the amount of traffic to be won over is not very substantial), make their Governments appreciate the advantages of rail transport and maintain frequent contacts with the press and all policy-makers.

60. To has end, participants agreed to adopt a recommendation for the organizing of a seminar on market research and railway sales techniques.

61. The lecturer emphasized that it would be useful for railways to earnestly request their Governments and port authorities to grant subsidies for the construction of rail/road terminals and railway lines within the ports. The social cost element and the sharing of the operating deficit among the various railway customers were discussed.

(b) Technical operations

62. The lecturer talked about the problem of the running of trains controlled from a district control office: the division of the control office into four section (control organization, post-forwarding checks, works) makes it possible to run a regular schedule and make optimum use of traction resources adapted to needs. The advantages of installing a centralized single track traffic control in order to increase the output of such a line was emphasized.

63. The methods of drawing up train schedules, planning of a passenger service to meet customer requirements and to suit the management of carriage stock were also talked about and the problem of international relations, the cost of peak traffic and the specific nature of suburban traffic were emphasized.

64. As far as freight transport process is concerned, forwarding by full train or by single or double grouping system using more or less elaborate marshalling yards according to the traffic were discussed. The lecturer explained the importance of co-ordinating rail and road transport, improving international links by establishing common stations, adopting the system of technical inspection under mutual trust and the signing of conventions on the exchange of wagons between two or more inter-connected networks in order to improve turn round of equipment.

65. The lecturer then talked about solutions to the specific problems of traffic between networks with different gauges. A film on the use of computors for centralized freight-traffic management was shown.

66. The UAR Secretary-General and the representatives of Senegal, Algeria and Gabon asked interesting questions about the running of trains when telephone links are disconnected; the number of staff required to operate a district control office; problems with the police and with the customs at border crossings in Africa or when trains interpenetrate the power units of different networks. They also asked questions about putting special trains into service, the relationships between the traffic operating and equipment departments in the programming of work, the need for progressive investments especially in data processing and the availability of software for optimizing the drawing up of train schedules for single track in order to increase the volume of traffic.

67. The UAR Secretary-General spoke about the prospects of signing a convention on the exchange of rolling stock in Africa.

Signalling (agenda item 6)

68. Mr. Savarzeix's presentation was to give a general idea of railway signalling especially in the area of single track.

69. Signalling ensured greater traffic volume and train security. To attain those objectives installations should have a good degree of availability because any breakdown hampered operations.

70. It was of paramount importance to have particularly efficient tools; they should be secured reliable and easy to maintain. The whole idea was to reconcile harmoniously all those objectives so that signalling installations had specific technological characteristics when compared with the industrial electro magnetic and electronic equipment available on the market.

71. He identified three types of installations (a) train spacing (to avoid overtaking); (b) station signalling (to avoid flank collisions); (c) operating aids; centralized traffic control (ensuring greater traffic regularity).

72. For the moment the first two types of signalling equipment relied on well-worn traditional techniques (electro-magnetic relay) which are, however, specifically related to railway techniques.

On the other hand the last type of techniques would henceforth utilize mico-computers which in the very near future would be of interest to other signalling areas.

73. Finally, he drew the attention of participants to two key points:

(a) Power supply of installations;
(b) Maintenance of the installations.

74. He concluded by touching on problems of electrification (50 Hz or 60 Hz of industrial current) and stated in a nutshell that any signalling equipment should be the result of a cost-performance compromise and that the solutions to that problem would be worked out by and large according to the type and volume of traffic.

Discussion

75. During the discussion that followed, the lecturer stated that, with respect to the automatic block. in many cases automatic detection devices were required: read of train detector, axle counter, or better still, track circuits.

76. In that connection the UAR Secretary-General stressed the need for modularity in the equipment in order to permit step-by-step investments without miscalculations.

77. Radio block automatic had not yet been developed because, on the one hand, it was less reliable and, on the other hand, it was difficult to send fail-safe messages.

78. With regard to a question on what action to take when a signal failed to come on, he said that such a case should be provided for in the operating rules: a signal should then be considered at danger by the driver; moreover, the signal may be supported by a repetition device; it would then be repeated at danger.

79. He gave the following answers to a question asked by the representative of Egypt (a) the maximum distance for a distant mechanical operating of points was about 300 m, (b) adapting a mechanical signal to greater speeds required the warning signal to be moved provided that the device for compensating the funicular transmission permitted it; failing that, a luminous signal should be installed, (c) it was very expensive to equip an existing railway network with a speed control system because of the great differences in the breaking characteristics of trains. On the other hand, such a system was perfectly conceivable for new high speed lines (TGV/SNCF) or rapid transits which operated trains with similar characteristics.

Personnel management (agenda item 7)

80. The two major objectives of staff policy are staff management and motivation.

81. Staff management is particularly crucial in the operation of railways, a labour-intensive activity in which staff costs constitute the bulk of the operational costs.

82. It is worth evaluating needs on the quantitative as well as qualitative basis taking into account the technical and economic development of the network, modifications in its organization and the making of new investments. In order to avoid over-staffing, it is necessary to prepare organizational charts setting out the structures, the staff required and the job profiles of candidates. Staff performance can be evaluated by monitoring productivity and setting limits for the number of staff to be employed by each establishment after consultation with the various hierarchies.

83. Training is the second basic aspect of staff management. It should be provided initially to provide basic training for staff in the railway profession and in mid-career to cater for advanced, refresher training and career development.

84. Staff may be motivated by the material advantages of their work, namely salary, career prospects and social benefits. They can also be motivated by structures that allow them to take initiative and responsibility, good working conditions, firm but human supervision and the opportunity for dialogue with management.

Discussion

(i) Training problems

85. The UAR Secretary-General outlined the Union's training policy:

- Reactivation of refresher training either in the field or in schools for field staff although some networks had abolished such facilities;

- Resumed monitoring of CSP2 training (Abidjan, Douala and Antananarivo); harmonization and upgrading of programmes;

- Establishment of subregional centres for staff training: African centres in Brazzaville, Kabwe, Zaria and Wardan for training railway personnel;

- Organization of seminars on specific subjects;

- Organization of biennial meetings of training instructors.

(ii) Staffing projections

86. (1) With regard to the management of staffing, SNCF projections are made each given year on the basis of the staff strength of the preceding year less a percentage that takes into account the returns on investments already made:

- At the local level, railway establishments study in depth the staffing needs, which are subsequently discussed at each level;

- The staff strength is determined after consultation with and, if necessary, concessions being made in the various hierarchies.

Even if the over-all estimates may raise no major problems, the situation could be more problematic at the local level.

87. (2) Transport staff projections are made on the basis of average traffic. For peak seasons (vacations, weekends) temporary staff who can be given crash training programmes (for example, of three days' duration for the second-in-comand) are hired.

(iii) Problems relating to structure and command

88. (1) Decentralization should be encouraged in as far as possible, especially with regard to commercial problems.

(2) On networks covering two countries which may be governed by different legislation, the Secretary-General of UAR said that for such networks as the Abidjan-Niger, Benin-Niger, Djibouti-Ethiopia arrangements should be maintained and political differences not be allowed to impede co-operation. It was up to railway employees to protect the system.

(3) Face-to-face dialogue did not abrogate the privileges of officials; on the contrary, all railway workers had to discuss together the problems affecting them. That might result in better decisions, particularly when such decisions were not imposed from above and workers had a better sense of their own worth when their comments and suggestions were taken into account (open discussion).

(4) Finally, the importance for all officials not to be stuck in their offices but to go as often as possible into the field was stressed. Seniors were more respected when they knew the work of their subordinates, were competent and could assume responsibility.

Telecommunications (agenda item 8)

89. As a preamble, M. Savarzeix emphasized the fact that the running of a railway requires various types of long-distance communication and that these are carried out through telecommunications facilities.

90. He distinguished between two groups of facilities:

- Transmission facilities
- Switching facilities

Transmission facilities

91. These are to ensure the transmission of information - telephones, telex system, data transmission system, etc.

- Between stationary units (from one station to the other, from one exchange to an open line telephone, etc.);

- Between one stationary unit and a mobile unit (ground-to-train radio link between a control centre and the engine driver);

- Between mobile units (local radio link within a main railway complex: port area, marshalling yard, etc.).

92. The lecturer indicated that the transmission carriers used are cables, radio links and more recently microwave links.

93. The technique is developing very fast in all these aspects and railways, except in a few special cases, have the greatest possible demand for the equipment available on the market:

- Multiplex systems (PCM - Pulse Code Modulation, etc.);
- Integrated circuits (radio sets, data transmission equipment, etc.).

Switching facilities

94. These are used to provide a communication link for two users:

- Within the station itself (between a signed telephone and the signalman, etc.);

- Within a general control telephone network (automatic telephone exchange, etc.);

- Within a telex network.

95. There is a wide range of technical alternatives for providing these links: electromagnetic relays, exchanges of the "crossbar" type, and especially time division switching systems - using exclusively electronics (switching network controlled by computer) which have been in use recently.

96. Finally, the lecturer said that telecommunication circuits (carrier current circuits, microwave links, ground-to-train systems) are now used as carriers for safety circuits (for example, one-way track interlocking between stations).

97. Mr. Savarzeix then answered participants' questions. In the case of ground-to-train radio networks he pointed out that SNCF had opted for "open-line" systems rather than selective dialling systems because they are less expensive. He also pointed out that transmission by satellite was not as yet of much interest for railways. However, the UAR Secretary-General indicated that the Union was linked to AFROSAT for possible use in the future.

98. As far as underground cables were concerned, he underlined the fact that certain precautions must be taken when laying them: in particular he stressed that it was most desirable for such work to be supervised by a railway employee who is a specialist in this field. The leader of the French delegation emphasized the need for a detailed plan showing the exact locations of the underground cables in order to avoid possible damage when civil engineering work is being carried out.

99. As for overhead circuits, he confirmed that transmissions by carrier currents was possible, but in limited numbers, and some safety measures must be taken against lightening.

100. The Director of OFERMAT then stressed the importance of vocational training in the fields of signalling and telecommunications. In this respect it was necessary to appeal to the manufacturers themselves. Moreover, there are two forms of training: formal and on-the-job training.

101. Finally, the representative of Gabon railways talked about his own experiences as far as training was concerned.

Evaluation of the Seminar (agenda item 9)

102. During the evaluation session, participants laid emphasis on:

(a) The need to make use of both the experience gained by the railways of the developed countries and the more relevant experience of African railways; papers were to be presented by African railway managers in this connection;

(b) The need to organize seminars.

(i) On sales techniques and public relations as applied to railways;

(ii) On supplies and stores management.

(c) The importance of working documents which should as much as possible be made available to participants before the holding of the seminar;

(d) The financial situation of railways and the need for UAR to seek sponsorship for participants.

RECOMMENDATIONS

The participants in the Seminar on Railway Management and Operation, held at Addis Ababa, Ethiopia from 22 to 26 November 1982,

Recommend that management decentralization be closely considered by African railways taking into consideration the local conditions and the objectives of the networks,

Recommend that the railway organizational tructure should be maintained and abrupt major changes should be avoided;

Recommend that regular training of personnel should be undertaken with a view to availing qualified staff and increasing productivity,

Recommend that technological innovations should be introduced gradually taking into consideration the prevailing local conditions,

Recommend that the introduction of automated data processing should be encouraged and advantage of computer system be utilized in accounting, operation, and management,

Recommend that marketing and market research units be established and and Training courses and seminars be organized within each railway network,

Recommend that public relation officers be recruited and trained to establish relations with the public with a view to improve the railway image,

Request the Union of African Railways in co-operation with the 'Ecole nationale des ponts et chaussées' and the Economic Commission for Africa to organize a seminar on marketing, public relations, supplies and stores,

Request the Union of African Railways to study the development of road/rail combined transport taking into consideration the experience of the Société nationale de chemins de fer of France and the experience of the African networks,

Recommend that African railways should develop their signalling and telecommunication systems to increase line capacity and safety of operation taking into consideration traffic volumes and speed requirements,

Considering the European experience, request the Union of African Railways to study the possibilities of establishing joint African financing companies to provide investment funds for member railways.

I. VOTE OF THANKS TO THE FRENCH GOVERNMENT

The participants in the Seminar on Railways Management and Operation held at Addis Ababa, Ethiopia from 22 to 26 November 1982,

Bearing in mind the valuable contribution of the French Government through OFERMAT, SNCF and ENPC in the organization of the Seminar,

Bearing in mind the quality of lectures and the valuable documents provided,

1. Express their thanks to the French Government, OFERMAT, SNCF and ENPC;

2. Express hope that they continue their valuable contribution in organizing more seminars in the field of railway management training.

II. VOTE OF THANKS TO THE GOVERNMENT AND PEOPLE OF SOCIALIST ETHIOPIA

The participants in the Seminar on railway Management and Operation held at Addis Ababa, Ethiopia 22 to 26 November 1982,

Bearing in mind the warm reception and favoured treatment accorded to them,

1. Express their appreciation for the hospitality shown to them;

2. Express to Comrade Mengistu Haile Mariam, Chairman of PMAC and COPWE, the Government and the people of Ethiopia and the Djibouti-Ethiopia Railway management and staff, their gratitude for the important contribution in the success of the Seminar.

III. VOTE OF THANKS TO THE ECONOMIC COMMISSION FOR AFRICA AND THE UNION OF AFRICAN RAILWAYS

The participants in the Seminar on Railway Management and Operation held at Addis Ababa, Ethiopia from 22 to 26 November 1982,

Bearing in mind the joint participation of the Economic Commission for Africa and the Union of African Railways in organizing this seminar,

Bearing in mind the organization and the facilities provided,

Appreciate the efforts of the Commission and the Union in the development of African railway networks,

Express their thanks to the Commission and the Union for the organization of the seminar and the facilities provided;

Express hope that the Commission and the Union continue their co-operation in organizing more seminars in the field of management training and further their co-operation in the implementation of the Decade railway projects.